

Moment of Inertia of Arm													
Section	dx [in]	dy [in]	Base [in]	Height [in]	Area [in^2]	Volume [in^3]	Mass [slugs]	lx' [ft^4]	lx'' [slugs-ft^2]	lx [slugs-ft^2]	ly' [ft^4]	ly'' [slugs-ft^2]	ly [slugs-ft^2]
A1	-0.6875	0.03125	1.15625	0.1875	0.217	0.054	4.78E-04	3.06E-08	9.73E-09	4.95E-06	1.16E-06	3.70E-07	3.80E-07
A2	-0.4375	0.125	1.5625	0.0625	0.0977	0.024	2.16E-04	1.53E-09	4.87E-10	9.02E-07	9.58E-07	3.04E-07	3.78E-07
A3	0.15625	0.0625	0.40625	0.1875	0.0381	0.010	8.40E-05	1.08E-08	3.42E-09	4.83E-08	5.05E-08	1.61E-08	2.32E-08
Radius [in]													
A4	0	0	0.0625		0.0123	0.0031	5.04E-07	5.78E-10	3.42E-12	3.42E-12	5.78E-10	3.42E-12	3.42E-12
A5	0.9375	-0.03125	0.03125		0.00307	7.67E-04	1.26E-07	3.61E-11	2.14E-13	1.30E-07	3.61E-11	2.14E-13	1.30E-07
A6	1.03125	-0.03125	0.03125		0.00307	7.67E-04	1.26E-07	3.61E-11	2.14E-13	1.57E-07	3.61E-11	2.14E-13	1.57E-07
Totals					0.334	0.084	7.77E-04	4.23E-08	1.36E-08	5.61E-06	2.17E-06	6.91E-07	4.94E-07

dx: Distance from pivot

ly = ly' + dx^2 * A

b: base length

h: height

Thickness of Arm
0.25 in

Density of Arm	1006 Carbon Steel
0.284 lbs/in^3	
15.253 slugs/ft^3	

Moment of Inertia of Arm	
X-axis	5.61E-06 [slugs-ft^2]
Y-axis	4.94E-07 [slugs-ft^2]

Moment of Inertia of Pulley 1												
dx [in]	dy [in]	Radius [in]	Area [in^2]	Width [in]	Volume [in^3]	Mass [slugs]	lx' [ft^4]	lx'' [slugs-ft^2]	lx [slugs-ft^2]	ly' [ft^4]	ly'' [slugs-ft^2]	ly [slugs-ft^2]
0	0	0.3125	0.307	0.125	0.03834952	4.91079E-05	1.15E-07	2.65E-09	2.65E-09	3.61E-07	8.33E-09	8.33E-09

Moment of Inertia of Pulley 2												
dx [in]	dy [in]	Radius [in]	Area [in^2]	Width [in]	Volume [in^3]	Mass [slugs]	lx' [ft^4]	lx'' [slugs-ft^2]	lx [slugs-ft^2]	ly' [ft^4]	ly'' [slugs-ft^2]	ly [slugs-ft^2]
0	0	0.3125	0.307	0.125	0.03834952	4.91079E-05	1.15E-07	2.65E-09	2.65E-09	3.61E-07	8.33E-09	8.33E-09

Cable				
Extra-Flexible, Braided, 18-8 Stainless Steel, 7 X 19, 0.024" Diameter				
Capacity	10 lbs	OD	.03"	
Pulley Diameter	5/8 in	Length	5 ft	
Part Number	34235T6	Price	\$ 10.10	

Density of Pulleys	Nylon 6 Plastic
0.0412 lbs/in^3	
2.213 slugs/ft^3	

Moment of Inertia of Pulleys	
X-axis	2.6502E-09 [slugs-ft^2]
Y-axis	8.33E-09 [slugs-ft^2]

Pulley			
Pulley for wire rope, with Bearing, for 1/32" Diameter, 5/8" OD			
Width	1/8 in	Part Number	3434T32
Material	Acetal Plastic	Price	\$ 1.46
Without Bearing			

Center of Mass of Arm						
Section	Area [in]	Volume [in^3]	Weight [lbs]	C.G. X-Coord [in]	C.G. Y-Coord [in]	
A1	0.217	0.0542	0.015392578	0.578125	0.09375	
A2	0.0977	0.0244	0.006933594	0.78125	0.0313	
A3	0.0381	0.0095	0.002704102	0.1354	0.0625	
A4	0.0123	0.0031	0.000871301	0.0625	0.0625	
A5	0.00307	0.0008	0.000217825	0.0313	0.0313	
A6	0.00307	0.0008	0.000217825	0.0313	0.0313	
Totals				0.616	0.0742	

Wire Rope Compression Sleeve-for Lifting			
For Steel Rope, Copper, for 1/32" Rope Diameter*			
Capacity	100% of Rope	Part Number	3897T31
Sleeve Length	1/4 in	Price	\$ 2.45

*Designed for a 7 X 7 Strand core rope, but this is all I can find so we're going to use it

Center of Gravity of Arm	[in]
0.616	X-axis
0.0742	Y-axis